## 2 CAST IRON TABLE

Several holes are drilled and tapped in the top of the Cast Iron Table (Fig 3.1.1 item 1). Eight of these, in two groups of four, are used in pairs to mount the VSU in either one of two positions relative to the C&L Table. Four are used for fixing the Cast Iron Table to the A/V mounts. Another four are fitted, when necessary, with lifting eyes to enable the base to be moved with lifting equipment. The circular aperture in the cast iron base acts as a housing for the spindle.

1 Magnet and Housing H45/9149
2 Spring-loaded Drive Pin 45/10671
3 Drive Block 45/10670
4 Drive Plate 46/7197
5 Spur Gear D643/73
6 Encoder K501/1399
7 Mounting Plate 46/7196
8 Driven Pulley 45/10669
9 Drive Belt B642/21
10 DC Motor/Gearbox B280/299
11 Drive Pulley H46/5279
12 Drive Body 46/7198
13 Gear Ring D643/74
14 Bottom Thrust Plate
15 Spindle TR265 K510/1042

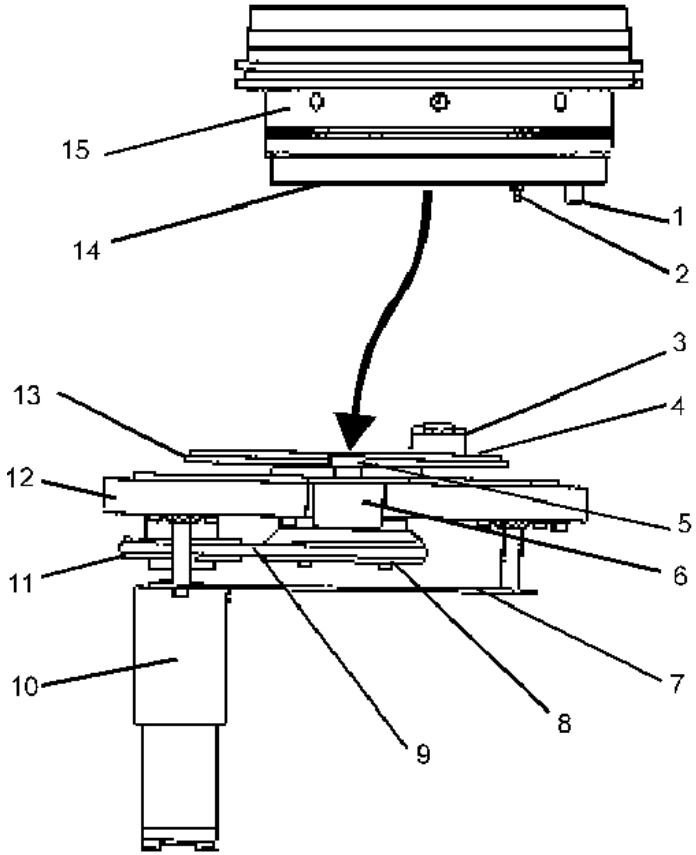



Fig 3.1.2 Spindle Drive

## 3 SPINDLE DRIVE

The Spindle Drive Assembly consists of a drive body (12) to which the mounting plate (7) is fixed. The mounting plate (7) carries a d.c. motor/gearbox (10) driving a drive pulley (11) mounted on the motor shaft. A circular cross-section polycord drive belt (9) transmits the drive to a drive plate (4) via the driven pulley (8). The drive plate and driven pulley assembly revolve in a bearing in the drive body (12). The d.c. motor is powered by an output from the Motor Drive Board K508/925 (located in the electronics box). The drive to the Spindle (15) is transmitted by means of the Spring-loaded Drive Pin (2) in the bottom thrust plate (14) of the Spindle which engages with a spring attached to the Drive Block (3) on the drive plate (4). A gear ring (12) on the drive pulley (11) drives a spur gear on the encoder (6) which provides positioning data. A magnet in the housing (1) mounted on the bottom thrust plate (14) of the Spindle passes over a Spindle Pulse Board K508/930 (fitted to the spindle sleeve - not shown) with each revolution which provides a pulse to act as the starting reference for data logging purposes. For constructional details of this assembly see GA 510/1037, Fig 3.1.9 refers. For Electrical details, see Sections 4-1 and 4-7.

# 4 PNEUMATIC SYSTEM

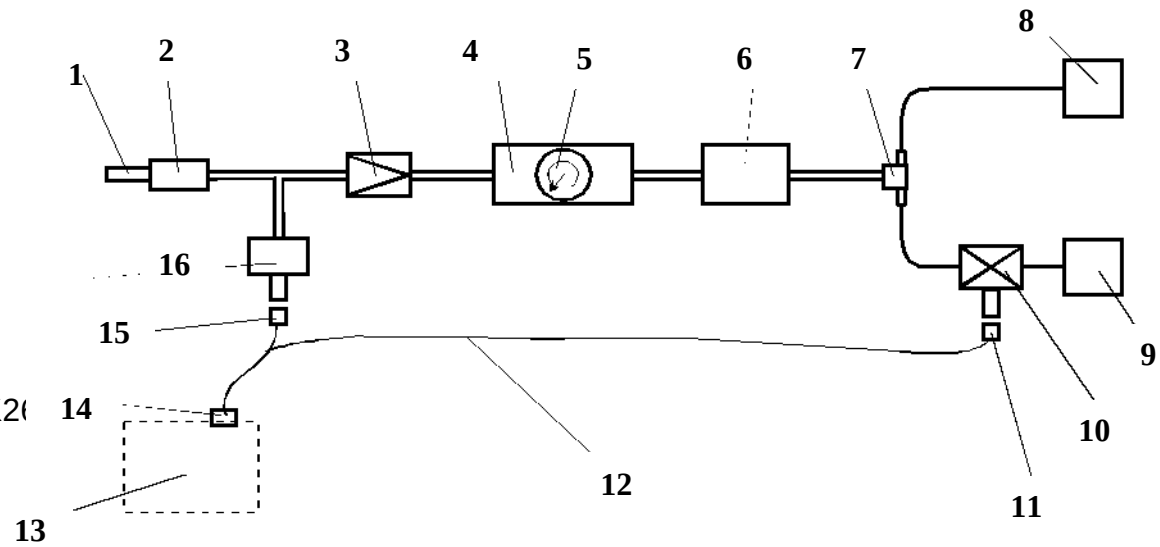
**CAUTION**

It is essential that this instrument is supplied with compressed air of an adequate standard, Section 1.3, Para 4 refers.

4.1 Refer to Fig 3.1.3. Compressed air is supplied to the instrument via the push-fit air connector (1) and the sleeve valve at the back of the panel and is passed through a Tee junction to a non-return valve on the front of the unit and then to the Filter/Regulator Assembly (5). This provides the first stage of filtration and consists of a prefilter incorporating a 5µm filter element and the regulator where it is regulated to the system operating pressure of 3.4 bar gauge (50lbf/in$^2$ gauge); the pressure being monitored by the air pressure switch (16). The prefiltered and regulated air then passes to the second stage of filtration consisting of a coalescing filter (6) that removes particles of contamination down to 0.03µm. Finally the fully filtered and regulated air passes to the manifold (7) which feeds air to the spindle air bearing (8) and, via a solenoid operated valve (10), to the Spindle clamp (9). For physical layout of the Filter/Regulator/Manifold Assembly, refer to Fig 3.1.5.

1 Inlet (on the back of the Panel)
2 Sleeve Valve
3 Non Return Valve
4 Filter/Regulator Assembly
5 Pressure Gauge
6 Coalescing Filter
7 Manifold
8 Spindle Air Bearing
9 Spindle Clamp
10 Solenoid Valve for Spindle Clamp
11 Electrical Connector Plug
12 Cableform K509/1327
13 Motor Drive Board (in electronic box)
14 Electrical Connector Plug & Socket PL26/SK2(
15 Electrical Connector Plug
16 Air Pressure Switch

Fig 3.1.3 Pneumatic System Schematic




4.2 An air reservoir is available as an optional item. In the event of a failure in the air supply it, in association with the non-return valve (3), ensures that the period of time over which the system air pressure falls is extended. This gradual reduction in pressure at the bearing faces prevents metal to metal contact occurring until after the spindle has stopped moving.

## 5 DISMANTLING

**Note** Most servicing can be undertaken on the Radial Straightness Unit (RSU) and the Vertical Straightness Unit (VSU) without removing the VSU from the instrument Base. However, the C & L Table will need to be removed to gain access to the Spindle or the spindle drive mechanism (including Spindle Pulse Board K508/930). Instructions for the removal of the TR265 C&L Table and Spindle are given in Section 3-3. Instructions for the removal of the covers and the VSU are given in Section 3-4.

### 5.1 REMOVAL AND DISMANTLING OF THE SPINDLE DRIVE - Fig 3.1.4

**Notes**

(1) The weight of the Spindle Drive Assembly is 4.6 kg. Exercise care when removing the assembly from within the Base Frame.

(2) As access is restricted, it will be necessary to remove the front and rear panels from the frame.

(3) For Plug and Socket connections, refer to Section 4.1, Fig 4.1.4 Electrical Schematic 112/2852-01sh3 .

5.1.1 Remove the front and rear panels from the frame.

5.1.2 Disconnect the socket SK59 on the cableform K509/1335 from PL59 on the cableform K509/1330 from the Spindle Pulse Board K508/930 and disconnect the socket on the cableform K508/1335 from the plug on the cable from the spindle encoder assembly (4).

Undo the two screws holding the spindle pulse board K508/930 to the spindle sleeve and remove the board.

5.1.3 Disconnect the two spade connectors from the drive motor (9), noting their positions for re-assembly (white: +ve, black: -ve).

5.1.4 Support the weight of the Spindle Drive Assembly, and remove the three M4 x 25 cap head screws D650/30425 and washers D680/103 securing the drive body 46/7198 to the underside of the spindle sleeve, and lower and manoeuvre it out of the frame.

5.1.5 Remove the three M4 x 6 Socket Cap Screws D650/3046 and washers, D680/104 and B671/204 (10) holding the motor mounting plate (5), to the pillars B250/964 on the AV mounts B45/8461 on the drive body. Release the tension on the drive belt (7), and taking care not to damage the drive belt, remove the motor and mounting plate assembly from the drive body and remove the drive belt.

5.1.6 On the Drive Motor, remove the Circlip B606/249 from above the pulley support H45/7974, and remove the pulley support. Undo the M3 Cap Screw D650/30316 on the adaptor H45/7973 and remove the drive pulley, clutch & bearing B640/394 and adaptor assembly from the motor shaft.

5.1.7 Undo the four M3 Cap Screws D650/3036 and spring washers B671/203 (11) holding the motor to the Mounting Plate and separate these components.

5.1.9 Undo the three M4 x 16 Socket Cap Screws D650/30416 and M4 Plain Washers D680/104 and remove the three pillars B250/964 from the AV mounts B45/8461. Undo the three M3 x 6 Cap Screws D650/3036 holding the Encoder Assembly (4) to the drive body and remove it. The Spur Gear D643/73 can be removed from the Encoder if required by releasing the M2 x 5 Cheese Head screws holding it to the encoder shaft.

5.1.10 If it is necessary to remove the three AV mounts B45/8461, undo the four M3 x 6 Socket Cap Screws (3) fixing each of them to the Drive Body D650/3036.

5.1.11 Remove the two M3 x 14 Cap Screws D650/30314 and spring washers B671/203 (6) from the driven pulley (12), and remove the pulley from the drive plate (2). Withdraw the drive plate and main gear ring assembly (2) from the drive body.

**Note** For normal service requirements, it should not be necessary to continue further dismantling of the assembly. If further dismantling is required, refer to GA K510-1037, see Fig 3.1.9 at the end of this section.

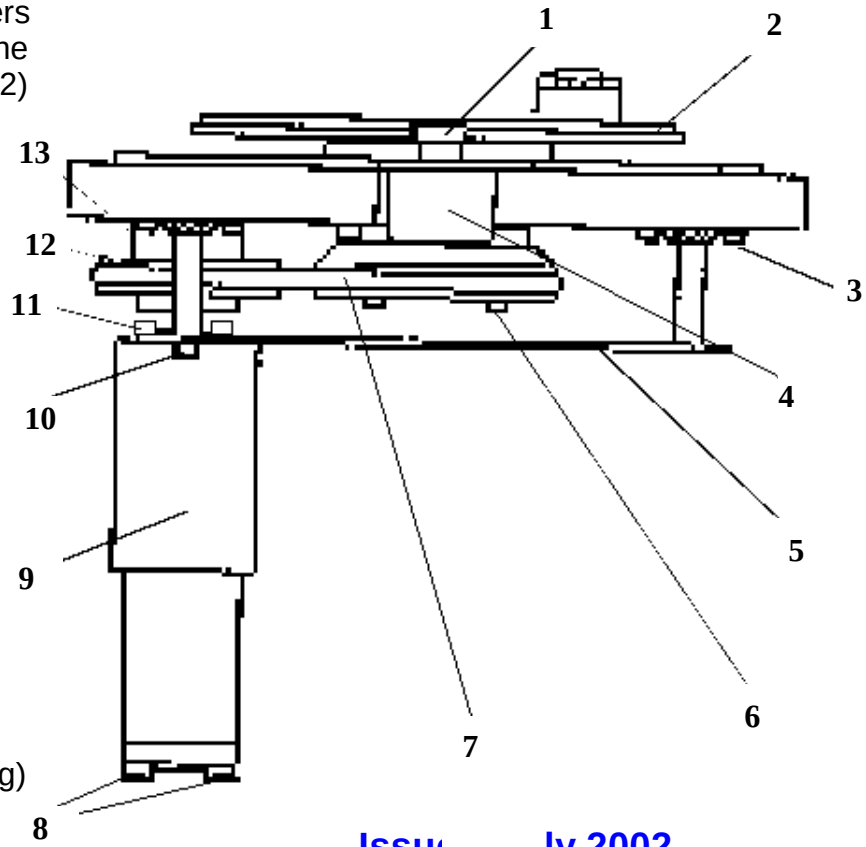



Fig 3.1.4 Spindle Drive (dismantling)

1 Spur Gear D643/73
2 Drive Plate 46/7197
3. M3 x 6 Socket Cap Screws D650/3036
4 Encoder K501/1399
5 Mounting Plate 46/7196
6 M3 x 16 Screws D650/30316 and M3 spring washers B671/203
7 Drive Belt B642/21
8 Terminals for spade connectors on motor (wires in cableform K509/1335)
9 Motor/Gearbox B280/299
10 M4 x 6 Screws D650/3046 and M4 plain washers B680/104 and M4 spring washers B671/204
11 M3 x 16 Screws D650/30316 and M3 spring washers B671/203
12 Drive Pulley H46/5279
13 Pulley Assembly